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ABSTRACT

Following a two-page summary of a project conducted to develop course outlines for the approved vocational agriculture courses taught in the State of Washington high schools, this document presents course outlines and lists of recommended instructional materials for the following courses: Production Agriculture (including Agriculture I--Introduction to Agriculture, Agriculture II--Crop Production and Introduction to Soil Science, Agriculture III, and Agriculture IV); Horse Husbandry; Agriculture Mechanics (Beginning, II, III, Agricultural Building Construction, and Advanced); Ornamental Horticulture (Beginning and Advanced); Forestry I; and Logging Forestry Practices. A typical course outline consists of the title of the course, unit titles, topics to be covered under each unit, and days allotted for each topic. (LMS)

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RESEARCH PROJECT

PROJECT NO. 76 - (264) NP

COURSE OUTLINES
IN
VOCATIONAL AGRICULTURE

Research Project in Vocational Education
Conducted Under
Part C of Public Law 90-576

The project reported herein was performed pursuant to a grant from the Research Coordinating Unit of the Washington State Commission for Vocational Education. Contractor undertaking such projects under the Commission for Vocational Education sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Commission for Vocational Education position or policy.

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SUMMARY OF REPORT

A. The time period covered by this report was from April 15, 1976, to September 30, 1976.

B. The goals and objectives of this project was to develop course outlines for each approved vocational agriculture class which is taught in the State of Washington.

C. Procedures followed:

1. Design survey form and mail to each vocational agriculture teacher in Washington. See Appendix A

2. Consolidate returned survey forms.

3. Invite a committee of 17 vocational agriculture teachers to review consolidated survey returns and develop recommended course outlines for each vocational class.

D. Results:

1. Received survey forms back from 59 of the 156 high schools with vocational agriculture programs, covering 25 different classes. These returned forms were tabulated and recorded by class. A committee of 16 vocational agriculture teachers met on August 24 - 25, 1976, reviewed the tabulated course outlines and prepared course outlines which will serve as recommended course outlines for approved vocational agriculture classes in the State of Washington. See Appendix B

BODY OF REPORT

A. A serious problem existed in the State of Washington as there had been no recently developed course outlines for any of the vocationally approved classes in agriculture. The Agriculture Education Section in the Office of the Superintendent of Public Instruction consistently receives requests from vocational agriculture teachers and vocational administrators for such outlines when they are revising and updating existing classes and when they are developing new classes. Without course outlines, providing teachers and vocational administrators with consultive service was cumbersome and difficult.

B. The goals and objectives of the project were to develop course outlines for each approved vocational agriculture class which is taught in the State of Washington.

C. This project was designed to develop course outlines for

each vocationally approved agriculture class that is offered in the high schools of the State of Washington. The student population enrolled in vocational agriculture classes includes both male and female, ages 14 through 19, grades 9 through 12 and includes many disadvantaged students. The instructional staff consists of 236 men and women teachers who are all vocationally certificated. Approximately 200 of these have graduated with degrees in Agriculture Education from accredited universities and the remainder have been certificated to teach agriculture specialty classes and met certification requirements through occupational experience in the specific agriculture area being taught. A survey instrument was developed and sent to each certificated vocational agriculture teacher in the state to be completed and returned on each vocationally approved class being taught. A secretary tabulated and consolidated the return survey forms by class code. Upon completion of the tabulation process, a committee of 16 vocational agriculture teachers met to review the consolidated course outlines and write course outlines for each approved vocational agriculture class. This group of teachers also compiled a list of text books, reference materials and visual aids which would be appropriate for each subject matter area. The course outlines and resource materials listed have been typed and are now available for use by vocational agriculture teachers and vocational administrators. See Appendix B

D. Completed survey forms were received from 59 of the 156 high schools offering vocational agriculture programs covering 25 different classes. These returned forms were tabulated and recorded by class. A committee of 16 vocational agriculture teachers met on August 24 - 25, 1976, in Ellensburg, reviewed the tabulated course outlines and prepared course outlines which will serve as recommended course outlines for approved vocational agriculture classes in the State of Washington. Three of the teachers worked on horticulture classes, three on foresty classes, four on agriculture mechanics classes and six on production agriculture classes. These teachers also compiled a list of textbooks, reference material and visual aids which would be appropriate for each subject matter area. See appendix B

E. Conclusions, implications and recommendations. Course outlines have been developed for nearly all of the vocationally approved agriculture classes taught in the high schools in the State of Washington. These will be provided to teacher and vocational administrators who are planning new classes or programs or are updating their present programs.

At the present time, work is progressing on a project to develop curriculum guides for the various vocational agriculture classes. The intent is to "marry" these with the course outlines developed under this project, then it is recommended that the course outlines and curriculum guides be studied by appropriate committees from the agriculture industry to insure that the end product meets the needs of both employers and employees in the industry. The end product should greatly improve the instructional program in all vocational agriculture classes.

APPENDIX A

SURVEY FORM

VOCATIONAL AGRICULTURE CLASS OUTLINE

Survey Form

Vocational Agriculture Class Outline

Due Date: March 1, 1970

School _____

Instructor _____

Course Title _____

Length of Course: Full year ____ Semester ____ Trimester ____ Quarter ____ Other ____

If other, how many days? ____

Length of Class Period: 45 min. ____ 50 min. ____ 55 min. ____ 60 min. ____

65 min. ____ 75 min. ____ 2 hr. ____ Other ____

If other, how long? ____

Grade Level _____

Text _____

Major References: (List only those you consider outstanding.)

1. _____
2. _____

Visuals: (List only those you consider outstanding.)

1. _____
2. _____
3. _____

COURSE OUTLINE

Enterprises & Units (Major areas of instruction)	Days	Hours**

** If the class is for more than one period, please indicate the number of hours.

APPENDIX B

INSTRUCTIONAL MATERIALS
AND
RECOMMENDED TEXTS, REFERENCES AND VISUALS

PRODUCTION AGRICULTURE

Review Committee

Chevy Chase	Sunnyside
Ken Howard	Sedro Woolley
Lynn Parton	Prosser
Wynn Van Ausdle	Colton
Roger Willis	Sunnyside
Don Witke	Selah

The production agriculture committee consolidated all phases of production agriculture into four one year courses (Ag. I, II, III and IV.) with the following recommendations and considerations:

1. That a complete vocational agriculture program consist of four years of instruction.

2. That, if at all possible, the curriculum should include approximately 50% agriculture mechanics. The teacher, with the assistance of the local advisory committee, should determine which portions of the production agriculture course outline should be deleted or de-emphasized and which portion of the ag mechanics course outline should be included so that the vocational agriculture curriculum will best meet the needs of the community and also fit the facilities available.

3. Where schools are on the semester or trimester systems specialized units of instruction may be readily taken from the one year Ag I, II, III or IV course outlines to develop semester or trimester units. Examples would be:

   A. Animal Science
   B. Crop Production
   C. Soils and Fertilizers
   D. Agribusiness
   E. Farm Management
   F. Animal Nutrition
   G. Advanced Animal Science
   H. Tree Fruit Production

AGRICULTURE I - INTRODUCTION TO AGRICULTURE

		DAYS
UNIT I.	Orientation - Future Farmers of America	10
	A. Brief History	
	B. National	
	C. State	
	D. Local	
	E. Aims and Purposes	
	F. Organization	
	G. Constitution, Creed	
UNIT II.	Orientation - Agriculture Industry	10
	A. Production and Agribusiness	
	B. Careers in Production Agriculture	
UNIT III.	Supervised Occupational Experience Programs	10
	A. Explanations of Types of Programs	
UNIT IV.	Record Bookkeeping	12
	A. Purpose and Need 1	
	B. Practice Record Book 8	
	C. Open Individual Record Books 3	
UNIT V.	Animal Science	25
	A. Swine Unit	
	1. Breed Identification 4	
	2. Industry 2	
	3. Breed Characteristics 3	
	4. Selection of Animals (Parts and Judging) 7	
	5. Management 2	
	6. Buildings & Equipment 2	
	7. Diseases & Parasites 3	
	8. Marketing 2	
	B. Beef Unit	25
	1 - 8 same as above	
	C. Sheep Unit	25
	1 - 8 same as above	
	D. Dairy Unit	25
	1 - 8 same as above	
	E. Poultry Unit	25
	1 - 8 same as above	

			DAYS
UNIT VI.	Parliamentary Law		14
	A. Purpose	1	
	B. Types of Motions	7	
	C. Demonstrate Motions	6	
	1. Simulate Washington Contest		
	a. Use of Practice Topics		
UNIT VII.	Public Speaking		11
	A. Preparation	3	
	B. Delivery		
	C. Questions	8	
	Testing and Quizzes		10
	Meeting and Assemblies		6
	Field Trips		4

AGRICULTURE II

CROP PRODUCTION AND INTRODUCTION TO SOIL SCIENCE

			DAYS
UNIT I.	FFA And Related Activities		20
	A. Public Speaking		
	B. Parliamentary Procedure		
	C. Chapter Farmer Requirements		
	D. Project Work		
UNIT II.	Orientation to Crop Production		5
	A. Where Crops are Grown		
	1. Worldwide		
	2. Nationwide		
	3. Statewide		
	4. Locality		
UNIT III.	Plant Growth and Reproduction		10
	A. Functions of leaves, roots stems etc.	4	
	B. Plant Classification	2	
	C. Methods of Reproduction	4	
UNIT IV.	Plant Identification		20
	A. Crop		
	1. Cereal		
	2. Vegetable		
	3. Seed		
	B. Weed		
	1. Seed		
	2. Noxious		
UNIT V.	Plant Pest and Their Control		15
	A. Weeds	4	
	B. Insects	4	
	C. Plant Diseases	4	
	D. Chemical Safety	3	
UNIT VI.	Study of Specific Crops of Importance		90
	A. National - Cereal Grains, Forages Vegetables		
	B. State - Cereal Grain, Forages Vegetables, Orchard Crops, Specialty Crops		

		DAYS
UNIT VI.	Study of Specitic Crops of Importance (cont.)	
	C. Local - Dependent Upon Need	
	D. Cover History, Use, Propagation, Harvesting Marketing	
	E. Economics of Each Crop Produced Locally	
UNIT VII.	Soils - Introduction	11
	A. Soil Formation 3	
	B. pH 1	
	C. Fertility 2	
	D. Land Judging 5	
	Days left for school assemblies and other School Business	9

AGRICULTURE III

			DAYS
UNIT I.	FFA and Related Activities		25
	A. Record Books		
	B. Parliamentary Law		
	C. Public Speaking		
	D. Stock Show - Fair		
	E. Chapter Project		
UNIT II.	Parliamentary Law and Public Speaking		10
UNIT III.	Livestock Management Skills		20
	A. Castration		
	B. Dehorning		
	C. Branding		
	D. Artificial Inseminsation		
	E. Hoof Trimming		
	F. Hoof Fitting		
	G. Vaccination		
UNIT IV.	Genetic and Breeding		15
	A. Dominance		
	B. Quantitative Genetics		
	C. Artificial Insemination		
	D. In-Breeding		
	E. Line Breeding		
	F. Hybrids		
UNIT V.	Feeds and Feeding		30
	A. Nutrients - Their Funcion and Source	10	
	B. Physiology of Animals	5	
	C. Types of Feed	5	
	D. Feed Additives	2	
	E. Ration Balancing	8	
UNIT VI.	Soils		25
	A. Structure	2	
	B. Texture	2	
	C. Organic Matter	6	
	D. Water Movement	5	
	E. Alkalinity	2	
	F. Acidity	2	
	G. Fertility	6	

			DAYS
UNIT VII.	Agribusiness		15
	A. Types		
	B. Job Opportunities		
	C. Skills Required		
UNIT VIII.	Business Organization		15
	A. Types		
	1. Cooperatives		
	2. Partnerships		
	3. Corporations		
	4. Individual Proprietorships		
	B. History		
	C. Organization		
	D. Advantages		
	E. Disadvantages		
	F. Management		
UNIT IX.	Surveying and Map Reading		15
	A. Transit	7	
	B. Compass	3	
	C. Legal Descriptions	2	
	D. Land Measurement	3	
UNIT X.	School Activities		10

AGRICULTURE IV

			DAYS
UNIT I.	FFA and Related Activities		30
	A. Record Books		
	B. Parliamentary Procedure		
	C. Public Speaking		
	D. Chapter Projects		
UNIT II.	Farm Management		45
	A. Purposes	1	
	B. Budgets	3	
	C. Rentals and Leases	2	
	D. Purchasing	2	
	E. Machinery Investments	4	
	F. Marketing	5	
	G. Farm Management Games	15	
	H. Government Programs	3	
	I. Financing	5	
	J. IRS	5	
UNIT III.	Agriculture Careers		10
	A. Job Opportunities		
	B. Public Sector		
	C. Private Sector		
	D. Local Guest Speakers		
UNIT IV.	Agriculture Chemicals		
	A. Fertilizers and Pesticides		
	1. Use and Application		
	B. Formulations and Mode of Action		
UNIT V.	Livestock Management Skills		10
	A. Field Trips		
	B. Practical		
	C. Butchering		
	D. Castration		
	E. Docking		
	F. Sheep Shearing		
	G. Shots		
UNIT VI.	Farmstead Planning and Beautification		10
	A. Lawns, Ornamental and Layout		

			DAYS
UNIT VII.	Agriculture Engineering		20
	A. Irrigation Systems	8	
	B. Fencing	2	
	C. Farm Machinery	5	
	D. Electrification	5	
UNIT VIII.	Horticulture		20
	A. Importance		
	B. Propagation		
	C. Care		
	D. Marketing		
	E. Areas of Production		
	F. Tree Fruits		
	G. Small Fruits		
UNIT IX.	Wildlife Management		15
	A. Competition Between Domestic and Wild Animals		
	B. Balance of Nature		
	C. Fisheries		
	D. Checkdam for Waterfall		
UNIT X.	Miscellaneous School Activities		10

Production Agriculture - Texts and References

Bundy and Diggins, Livestock and Poultry Production, Prentice Hall
F.F.A. Manual, FFA Supply Center
Record Book, Interstate Publishers
Knuti, Korpi and Hide, Profitable Soil Management, Prentice Hall
Donahue, Soils and Their Management, Interstate Publishers
Evans and Donahue, Exploring Agriculture, Prentice Hall
Richter & Wilson, Producing Farm Crops, Interstate Publishers
Delorit and Ahlgren, Crop Production, Prentice Hall
Approved Practices in Pasture Management
Leonard & Martin, Principles of Field Crop Production, Macmillan Co.
Morrison, Feeds and Feeding, National Farm Book Co.
Heath, Metcalf & Barnes, Forages, National Farm Book Co.
Doane, Farm Management Guide, Doane's Agriculture Service
Surveying Unit, Curriculum Management Center
Jackson, Parliamentary Law
Hall, Dynamics of Group Discussion, Interstate Publishers
FFA Advisor's Guide, FFA Supply Center
Ensminger, Animal Science, Interstate Publishers
Ensminger, Stockman's Handbook, Interstate Publishers
Ensminger, Beef Cattle Science, Interstate Publishers
Juergenson, Approved Practices in Sheep Production, Interstate Publishers
Juergenson, Approved Practices in Swine Production, Interstate Publishers
Extension Bulletin PNW 51, Cooperative Extension Service
Stamm and Burch, Veterinary Medicine for Farmers, National Farm Book Co.
Thrust '75 Material, FFA Supply Center
Beef Cattle Body Types, Cal. Poly.
Weeds and Their Control, Iowa State
Weeds of Eastern Washington, Cooperative Extension Service
Pamphlets, Home Gardens, Home Lawns, Tansy Ragwort, Grafting Fruit Trees, and Pruning the Home Orchard, Cooperative Extension Service
Using Arithmetic in Agriculture, U. of Illinois
Trees of Washington, W.S.U. Bulletin
Pesticide Handbook, W.S.U. Dept of Agriculture
FFA Thrust Information
Soils Manual for Land Judging, Cal. Poly.
Soil Science
Robert's Rules of Order, Interstate Publisher
Tax Unit, IRS
Crop Bulletins, U.S.D.A. and W.S.U., Cooperative Extension Service
Phipps, Farm Mechanics
Ensminger, Horses and Horsemanship, Interstate Publishers
Juergenson, Handbook of Livestock Equipment, Interstate Publishers
Fertilizer Handbook, Fertilizer Institute

Note: For additional texts and references refer to publication, Text and Reference Books for Use in Washington Agriculture Education Programs, 1972, available from the Agriculture Education Department at W.S.U.

Production Agriculture - Visuals

Living Soil
The SCS District
Careers in Agriculture, Cal. Poly Series
Fruits of a Lifetime
No Room for Weeds
Fresh From the West
Fresh Country Apples
Shop Safety
Some Call it Luck
Farm Credit Films, Farm Credit Administration, Spokane, Wa.
Slide Set, Selection of Pork, University of Illinois
Slide Set, Selection of Beef, University of Illinois
Ag. Chemical Safety, Cal. Poly
U.S. Steel Films, Growing Beets, Etc
John Deere Overheads, Slides
Miracle of Plant Growth

HORSE HUSBANDRY

This unit is set up for a trimester program and could easily be expanded to a full semester or a full year by in-depth study.

		DAYS
UNIT I.	FFA and Supervised Project	4
UNIT II.	Careers in Horse Industry	1
UNIT III.	History of the Horse Industry	2
UNIT IV.	History and Development of the Horse	4
UNIT V.	Anatomy and Action of the Horse	5
UNIT VI.	Selection and Judging	5
UNIT VII.	Unsoundness and Stable Vices	5
UNIT VIII.	Types, Classes and Breeds	5
UNIT IX.	Genetics	2
UNIT X.	Breeding and Reproduction	3
UNIT XI.	Nutrition	5
UNIT XII.	Building, Equipment	3
UNIT XIII.	Tools	1
UNIT XIV.	Health	5
UNIT XV.	Horsemanship	6
UNIT XVI.	Management and Business	3
UNIT XVII.	Equitation and Training	10
UNIT XVIII.	Horse Show Production	5

Horse Husbandry - Texts, References and Visuals

Ensminger, Horses and Horsemanship, Interstate Publishers
Cooperative Extension Service Bulletins, Cooperative Extension Service
The Western Horse, Interstate Publishers
Western Horseman, Magazine, Breed Association
Horse, Magazine, Breed Association
The Horse in North America, Washington State University
Four Footed Industry, Washington State University
Appaloosa, University of Idaho
Fundamentals of Stock Seat Equitation, University of Idaho
Jumping and Cross Country Riding, University of Idaho
Horse F.S. Series, Vocational Education, Cal. Poly
Horse Slide Series, Arabian Association
American Quarter Horse Films, American Quarter Horse Association

AGRICULTURAL MECHANICS

Review Committee

Rick Adams	Prosser
James R. McKay	Walla Walla
David Odenrider	Fife
Michael S[illegible]nders	Battleground

Agricultural Mechanics texts, references and visuals, refer to Agricultural Mechanics Teaching Materials Project, by C. O. Loreen, completed June 24, 1976.

BEGINNING AGRICULTURAL MECHANICS - FULL YEAR

		HOURS
UNIT I.	Agricultural Mechanics - Career Orientation	1
UNIT II.	FFA and Supervised Farming Program	3
UNIT III.	Record Keeping	2
UNIT IV.	Shop Safety - Safety Test	4
UNIT V.	Tool Identification	3
UNIT VI.	Grinders	2
UNIT VII.	Tool Sharpening	6
UNIT VIII.	Drill Bit Sharpening	6
UNIT IX.	Tap and Die	6
UNIT X.	Power Tool Usage (Tools to be used during the year)	8
UNIT XI.	Hardware and Fasteners	2
UNIT XII.	Arc Welding	22
UNIT XIII.	Oxy-acetylene Welding and Cutting	22
UNIT XIV.	Forge Work	8
UNIT XV.	Cold Work	6
UNIT XVI.	Bending and Forming	4
UNIT XVII.	Soldering and Sheet Metal	4
UNIT XVIII.	Pipe work and General Plumbing	4
UNIT XIX.	Basic Electricity	6
UNIT XX.	Basic Concrete and Masonry Construction	3
UNIT XXI.	Rope Work	3
UNIT XXII.	Basic Carpentry (Rafter Cutting)	8
UNIT XXIII.	Painting and Glazing	3

		HOURS
UNIT XXIV.	Tractor Operation, Maintenance and Safety	4
UNIT XXV.	Project Planning and Design Layout	3
UNIT XXVI.	Individual Projects	27

Operation and Safe y of Equipment and tools included in all units.

AGRICULTURAL MECHANICS II - FULL YEAR

		DAYS
UNIT I.	FFA	6
UNIT II.	Shop Safety	10
UNIT III.	Arc Welding	45
UNIT IV.	Oxy-acetylene Welding	45
UNIT V.	Heli-Arc Welding	20
UNIT VI.	Mig Welding	20
UNIT VII.	Sheet Metal and Soldering	4
UNIT VIII.	Individual Projects	30

AGRICULTURAL MECHANICS III - POWER MECHANICS - 1st SEMESTER

		DAYS
UNIT I.	FFA	4
UNIT II.	Supervised Occupational Experience	4
UNIT III.	Record Keeping	1
UNIT IV.	Introduction, Safety, Tools and Use	4
UNIT V.	4 Stroke Cycle, Names of Parts, Theory	7
UNIT VI.	Batteries and Service	3
UNIT VII.	Ignition System and Wiring	7
UNIT VIII.	Trouble Shooting	6
UNIT IX.	Valves and Service	4
UNIT X.	Piston and Rings	4
UNIT XI.	Rods and Bearings	2
UNIT XII.	Carburetors, Exhaust Systems	4
UNIT XIII.	Individual Projects	13
UNIT XIV.	2-Cycle Engines	1
UNIT XV.	Suspension	2
UNIT XVI.	Steering	2
UNIT XVII.	Routine Care and Maintenance	3
UNIT XVIII.	HP and Buying Considerations	1
UNIT XIX.	Cooling	2
UNIT XX.	Lubrication	2
UNIT XXI.	Check Engine Tolerances	2
UNIT XXII.	Use of Manuals	2
UNIT XXIII.	Differential, Drive Train, Brakes	4

AGRICULTURAL MECHANICS - AGRICULTURAL BUILDING CONSTRUCTION
2nd. Semester

		DAYS
UNIT I.	FFA and Orientation	3
UNIT II.	Basic Use of Carpentry Tools	5
UNIT III.	Reading and Using Drawings	5
UNIT IV.	Building Materials	2
UNIT V.	Concrete Work	5
UNIT VI.	Floor and Wall Framing	10
UNIT VII.	Roof Framing	10
UNIT VIII.	Figuring Bills	2
UNIT IX.	Caring for Lumber	2
UNIT X.	Nail and Screw Selection	2
UNIT XI.	Measuring and Marking Wood	1
UNIT XII.	Construction and Maintenance of Fences	5
UNIT XIII	Painting, Refinishing and Glazing	3
UNIT XIV.	Rural Electrication	5
UNIT XV.	Individual Project	27

AGRICULTURAL MECHANICS - ADVANCED - FULL YEAR

		DAYS
UNIT I.	FFA	10
UNIT II.	Supervised Occupational Experience	8
UNIT III.	Career Awareness	3
UNIT IV.	Shop Safety	2
UNIT V.	Advanced Welding Skills	14
UNIT VI.	Land Description	4
UNIT VII.	Farm Shop Metal Work	10
UNIT VIII.	Farm Machinery	14
UNIT IX.	Electricity	10
UNIT X.	Concrete and Carpentry	6
UNIT XI.	Forge Work	4
UNIT XII.	Operation and Use of Tractor	10
UNIT XIII.	Lathe Work	12
UNIT XIV.	Milling Machine	10
UNIT XV.	Project Planning	3
UNIT XVI.	Individual Projects	60

ORNAMENTAL HORTICULTURE

Review Committee

Geraldine Couture	Shadle Park, Spokane
Patricia Freeman	Ferris, Spokane
Tim Hicks	Battleground

For additional reference books and instructional materials, see List of Reference Books and Instructional Materials, submitted by Dr. Charles Pfeiffer. Available through Agricultural Education Office of S.P.I.

BEGINNING ORNAMENTAL HORTICULTURE

		DAYS
UNIT I.	Overview of Horticultural Industry	10
	A. Career Opportunities B. Career Counseling C. How to Get a Job D. Job Skills E. Horticultural Professional Organizations F. Field Trips to Related Industries	
UNIT II.	Plant Classification	5
	A. Principles B. Identify all Plants	
UNIT III.	Plant Growth, Structure Reproduction	5
UNIT IV.	Climate and Zonation	5
UNIT V.	Soils and Fertilization	5
	A. Structure and Origin B. NPK C. Plant Mixes D. Artificial Soil E. Composting	
UNIT VI.	Growing Structures	20
	A. Greenhouse and Equipment B. Gardening under Lights C. Dish Gardens and Terraria D. Plant Nursery E. Hot Beds, Cold Frames, Lath Houses	
UNIT VII.	Plant Disorders	10
	A. Weeds B. Diseases C. Insects D. Management Practices	
UNIT VIII.	Safety	5
	A. Pesticides B. Equipment C. Tools	

		DAYS
UNIT IX.	Floriculture (Will vary with instructor and program)	10
	A. Identity and care B. Know Equipment C. Arranging D. Corsage Making E. Flower Shows F. Industry Skills G. Holiday Specials (Wreathes etc.)	
UNIT X.	FFA Leadership	20
	A. Parliamentary Procedure B. Projects C. Record Keeping D. Contests	
UNIT XI.	Landscaping	20
	A. Principles of Design B. Site Analysis C. Drawing to Scale D. Plant Selection E. Construction and Maintenance F. Cost Analysis G. Turf Management	
UNIT XII.	Horticulture Crops	20
	A. Vegetable Garden B. Fruit Growing C. Ornamentals D. Bedding Plants E. Nursery	
UNIT XIII.	Plant Propagation	20
	A. Asexual B. Sexual	

ADVANCED ORNAMENTAL HORTICULTURE

May be with a cooperative work experience. Program will reflect what has been covered in Beginning Ornamental Horticulture.

UNIT I. Job Skills

- A. Business Education
- B. Marketing
- C. Public Relations
- D. Co-ops
- E. How to do Business

UNIT II. Greenhouse Management

- A. How to Grow Specific Crops

UNIT III. Marketing Horticultural Crops

UNIT IV. Construction

- A. Greenhouses
- B. Landscape
- C. Planters

UNIT V. Floriculture - Advanced Design

- A. Macrame
- B. Funeral and Wedding Work

UNIT VI. Propagation - Advanced Techniques

UNIT VII. Advanced Plant I.D.

UNIT VIII. FFA Activities for Advanced Leadership

- A. Supervised Work Experiences or Home Projects
- B. Contests
- C. State Award Applications

UNIT IX. Landscape Design

- A. Design to Scale
- B. Model to Scale
- C. Project
  - 1. Cost Analysis

UNIT X. Flower Show

A. Selection of Chairman and Committees
B. Theme
C. Printing Program
D. Designing Entries
E. Staging the Show
F. Supervising and Hosting Show
G. Application for State and National Awards Through Washington Federation of Garden Clubs

UNIT XI. Landscape Maintenance

A. Yard and Lawn Work
B. Pruning
C. Bidding and Estimates
D. Filing Contracts
E. Keeping Records

UNIT XII. Cooperative Work Experience

A. School Flower Shop
B. Local Business
C. Keep Daily Records

It is recommended that the advanced program (2nd. or 3rd. year) use the Washington Certified Nurseryman's manual for reference and that the passing of the test given by the nurserymen will be the basis for evaluation of the advanced program, unless student interest is in other fields.

With the consent of the instructor, the students should be able to have a work experience program with a related business in the field of their choice.

These course outlines were designed to standardize the horticulture curriculum so that a student completing a course in the State of Washington will have become familiar with the basics required for an understanding and for job entry in the horticulture field.

Further studies will reflect the interest of the student and the expertise of the instructor involved.

In no way is this to be construed as to exclude certain horticulture subjects or that all these materials must be covered in depth to maintain a good program.

Ornamental Horticulture

Basic Texts

*** Sunset Western Garden Book, Lane Magazine Book Co.
*** Certified Washington Nurseryman's Training Manual

Major References

** Exotica - Pictorial Encyclopedia, Rutherford
** Plant Propagation, Hartman Kester
** Principles and Practices, Prentice Hall
** Ball Red Book, George Ball Inc.
*** Horticulture References, Pennsylvania State University
*** Homescaping Bulleting - Available free through County Agent
*** Sunset Books, Lane Magazine Book Co.
*** Time-Life Books
* Western Fertilizer Handbook
*** Encyclopedia of Organic Gardening
** Houseplants for Purple Plum
*** Greenhouse Crop Production, Pennsylvania State University
*** Greenhouse Flowers and Bedding Plants, Pennsylvania State University

Bulletins

*** Homescaping, Cooperative Extension Service
*** Flower Arranging #310, Michigan State Horticulture manuals available through state office

Visuals

***Horticulture set slides and film strips, Cal. Poly
***Plant Life Set, Encyclopedia Britannica
**Ohio State Landscaping, etc., slides
***Certified Nursery Manual Plant Id Set - available through Steve Nord - $100.00 - Plant I.D. Media Systems
***Greenhouse and Related Structures, Ag. Ed. Curriculum Materials
***Landscape Design, Flowers for Garden Color, Designing with Flower and Decorative Materials, Ag. Ed. Curriculum Materials

Magazines

***Plants Alive
***Organic Gardening
*Horticulture
***House Plants and Porch Gardens
***Sunset
**Florist - (Floral Delivery
*Florist - Review
**Spirit - (Telaflorist Delivery)

***Most Valuable
** Desirable
* Helpful but not essential

FORESTRY I - One Year

Review Committee

Ron Nilson	Morton
Alf Ladderud	Kent
Dave Trier	Tacoma

The following is a composite outline of units presently taught throughout Washington State in Vocational Forestry. The units have been tentatively grouped into time blocks with a range of time recognizing differences in the needs for different parts of the State.

The grouping is based on a logical sequence for presenting the subject matter, however, factors such as local conditions, weather and other factors might make a change of sequence necessary.

FORESTRY I

		HOURS
UNIT I.	Introduction	3 - 5
	A. Course Requirements B. FFA C. Job Experience	
UNIT II.	History and Significance of Forestry	5 - 10
	A. State of Washington B. United States C. World	
UNIT III.	Dendrology	10 - 20
	A. Identification and Use of the Major Trees in Washington	
UNIT IV.	Regeneration	5 - 10
	A. Cone Harvests B. Genetics C. Nursery Practice D. Site E. Planting	
UNIT V.	Soils	5 - 10
	A. Physical and Chemical Properties of the Soil as Related to Forest Use	
UNIT VI.	Silvics	2 - 5
	A. Botany of the Tree as Related to Forestry Practices	
UNIT VII.	Silviculture - Forest Stand Improvement	10 - 30
	A. Fertilizing B. Thinning C. Brush and Weed Control D. Other	
UNIT VIII.	Forest Protection	5 - 10
	A. Against Disease B. Against Insects C. Against Animal Damage D. Against Man	

		HOURS
UNIT IX.	Maps and Legal Description of Property	10 - 15
UNIT X.	Survey and Compass Work	10 - 20
UNIT XI.	Timber Cruising and Log Scaling	5 - 10
UNIT XII.	Logging Practices	5 - 10
UNIT XIII.	Safety in the Woods	1 - 2
UNIT XIV.	Chainsaw Use and Maintenance	10 - 20
UNIT XV.	Marketing and Grading	2 - 5
	A. Standing Timber B. Logs C. Timber Products D. Other	
UNIT XVI.	Forest Economics	2 - 5
UNIT XVII.	Wood Technology	2 - 5
UNIT XVIII.	Christmas Tree Production	5 - 10
UNIT XIX.	Forest Laws and Regulations	1 - 2
UNIT XX.	Watersheds	1 - 2
UNIT XXI.	Recreation	1 - 2
UNIT XXII.	Range	1 - 2
UNIT XXIII.	Wildlife and Fisheries	5 - 10
UNIT XXIV.	Careers	2 - 5

Forestry I - Basic Texts

Trees of Washington, Washington State University
Trees Yearbook, 1949, U.S. Government Printing Office
Safety Standards for Logging Operations, Department of Labor and Industry, Washington St.
Stoddard, Forestry Practice
Extension Bulletins, U.S. Forest Service
Trier, Forest Conservation

Major References

Extension Bulletins, Cooperative Extension Service
Forest Service Bulletins, U.S. Forest Service
Game Dept. Bulletins, Washington State Department
Commercial Company Bulletins
Forbes, Forestry Handbook
Meyer, et al, Forest Management
Your Trees - A Crop
Forest Practices Curriculum Guide, Curriculum Management Center
Shirley, Forestry and its Career Opportunities, McGraw Hill
Guise, The Management of Farm Woodlands, McGraw Hill
Trefthen, Wildlife Conservation, D. C. Heath Co.
Lyon, Trees, Shrubs and Flowers to Know In Washington

Visuals

Industrial Safety Films, Department of Labor and Industries
Forest Service Films, U. S. Forest Service
Game Dept. Films, Washington State Department of Game
Wanless, Aerial Sterograms
Multiple Use Management Packet, U.S.F.S.
National Grassland, State Film Library
Tree Identification, Vocational Education Productions
Land Management Visuals, Washington State University
Tree Charts, St Regis, GP and others
Grass Transparency Masters, Washington State University
Working Forest
Northwest Empire
Fire Weather
Careers in Forestry
Careers in Logging

LOGGING AND FORESTRY PRACTICES

Review Committee

Warren G. Lowe	Longview
James Grush	Forks

The purpose of this course is to provide each student with an understanding of the various forest occupations, needed skills and various forest functions so that they may develop vocational proficiencies which will lead to gainful employment upon graduation.

Its purpose is also to teach the necessary theory of conservation, resource management and mechanical application in order to produce a trainee who appreciates the complete picture of forest conservation, either toward the ends of immediate employment, or to pursue a career in technical, or professional forestry.

LOGGING AND FORESTRY PRACTICES

		DAYS
UNIT I.	Orientation	
	A. Purpose of Course	1
	B. Classroom & Laboratory Procedures	1 - 2
	1. Roll Check	
	2. Conduct in Class	
	3. Tardiness and Attendance	
	4. How to ask a Question	
	5. Evaluation of Instruction	
	6. Grading System	
	C. Course Requirements	1 - 3
	1. Student Notebook	
	2. Course Fees	
	3. Clothing	
	4. Job Experiences	
	5. FFA	
	6. Safety	
	D. Teaching Procedures and Facilities Outside the Classroom	1 - 2
	1. Lab Area	
	2. Field Trips	
	3. Land Laboratory	
	4. Supervised Work Experience Visits	
	5. Field Days and Contests	
	6. Safety	
	E. Reference Materials	1 - 2
	1. Textbooks	
	2. Reference Books	
	3. Bulletins	
	4. Magazines	
	5. Mounts, Charts and other Aids	
UNIT II.	History of Logging in the Pacific Northwest	2 - 4
	A. Chapter in Textbook	
	B. Resource Books on "Old Time" Logging: Timber, This Was Logging, etc.	
	C. Springboard and How it was Used	
	D. Locating and Naming Early Day Logging Companies in Local Area	
UNIT III.	Basic Principles Involved in Logging (General Introduction)	10 - 20
	A. Kinds of Trees in Pacific Northwest	
	B. General Type or Terrain	

		DAYS
UNIT III.	Basic Principles Involved in Logging, Cont.	
	C. Felling and Bucking D. Yarding of Logs 1. High Lead 2. Cat Yarding 3. Rubber Tired Skidder 4. Sky Line 5. Slack Line 6. Balloon Logging E. Loading of Logs F. Transporting Logs to Mills G. The Manufacture of the Logs into all the Various Wood Products H. What Determines How a Tract of Timber Will be Logged	
UNIT IV.	Forest Regeneration	5 - 10
	A. Site Preparation B. Nursery and Transplant Culture C. Hand Planting D. Seeding	
UNIT V.	Cable	2 - 5
	A. Why it is Used and Purpose B. Kinds of Cable and How to Recognize the Various Sizes C. Costs of Different Sizes of Cable D. General Care of Cable and Proper Use E. Splicing 1. Tools to be used 2. 3 Tuck Eye Splice 3. Long Splice 4. Short Splice 5. "Farmer's Eye"	
UNIT VI.	Power Saws	20 - 30
	A. What They do ard What They Won't Do B. Various Kinds and Sizes C. A Short History of Their Evolution in Logging D. Operation of Saw E. How to Service and Care for the Saw F. Fuel, Kind and How to Prepare it	

		DAYS
UNIT VI	Power Saws, Cont. G. Filing of Saw Chains 1. How and Why the Chain Cuts (by its design) 2. Kinds of Files 3. Matching File and Chain 4. Angle and Stroke of File 5. Checking and Filing Riders 6. When to File and Keeping Chain Sharp	
UNIT VII.	Christmas Tree Culture A. Theory of Culture B. Species Characteristics C. Pruning and Shaping D. Bough Cutting and Brush Picking	3 - 5
UNIT VIII.	Forest Protection A. Fire Control B. Forest Insect Identification C. Forest Disease Identification D. Sanitation Inspection and Control Methods	5 - 10
UNIT IX.	Forest Stand Improvements A. Thinning (selective and strip) B. Thinning by-products 1. Post Treating 2. Poles 3. Shake Splitting C. Pruning 1. Dry 2. Green 3. Bud D. Fertilizing E. Chemical Controls	10 - 20
UNIT X.	Forest Measurement A. Sample Plot Cruising (prism) B. Strip Cruising C. Variable Plot Cruising (prism) D. Use Compass, Dumpy Level and Transit	3 - 5
UNIT XI.	High Lead Logging A. Evolution From Ground Logging B. Spar Tree, Selection, Topping, Rigging C. Portable Spar Tree D. Guy Lines	

		DAYS
UNIT XI	High Lead Logging, cont. E. Blocks F. Donkey 1. Main Line 2. Haul Back 3. Straw Line G. Laying Out Roads H. Flopping Lines I. Changing Roads J. Staying Out of the Bight K. Cold Decks and Hot Decks L. Landing and Loading Operations M. Rigging Chokers, Butt Rigging, Guy Lines Block Straps (Lines on Donkey) N. Guy Line Stumps O. Variations 1. Slack Line 2. Sky Line 3. Grabinski System 4. Inter-locking Skidder P. High Lead Signals 1. Standard High Lead Signals as Recommended by State Safety Division Q. Hand Signals 1. Standard Hand Signals from State Safety Manual	
UNIT XII.	Rubber Tired Skidder A. Operation B. Daily and General Maintenance C. Skidder as Compared to Crawler Tractor D. How to Get a Log per Minute	2 - 5
UNIT XIII.	Crawler Tractor Logging: Bob Tail and With Arch and Grapple A. Operation B. Daily and General Maintenance C. Compared to Skidder and Highload	2 - 5
UNIT XIV.	Felling and Bucking A. "Looking at Whole Tree for Falling" 1. Lay of Land 2. Other Standing Trees 3. "Widow Makers", Hazards, Natural and Man Made 4. How to Save the Tree 5. Escape Route	2 - 5

DAYS

UNIT XIV — Felling and Bucking, cont.

6. Clearing Brush Away from Tree
7. Wind Velocity and Direction
8. Type of Undercut, Safety Notch
9. Hinge or Holding Wood
10. Controlled Falling

B. Bucking the Tree into Log Lengths

1. Measuring for Grade, Ease of Bucking, Safety, Type of Logs Needed
2. Side Bind
3. Tight Wood and Compressed Wood
4. Undercutting - When and Why
5. Release Cut and Bucking from Uphill Side

UNIT XV. — Choker Setting — 2 - 5

A. What a Choker Consists of
B. Kinds, Lengths and Line Sizes of Chokers
C. Correct Way of Setting Chokers
D. Care and Mususe of Chokers
E. High Lead vs. Cat or Skidder Choker
F. Tricks in Being a Good Choker Setter
G. "Best" Job in the Woods
H. Dangers in Setting Chokers
I. "Trick" in Fighting Hang-Ups

UNIT XVI. — Job Titles and Duties in All Types of Logging — 2 - 5

A. Camp Push
B. Side Rod
C. Bull Buck
D. Hook Tender
E. Riggin Slinger
F. Climber
G. Chokerman
H. Powder Monkey
I. Donkey Puncher
J. Cat Skinner
K. Whistle Punk
L. Shovel Operator
M. 1st, 2nd and 3rd Loader

UNIT XVII. — Sealing and Grading Logs — 2 - 5

A. Why?? - Purpose, Theory, Philosophy
B. Bureau Scale (Scribner's)
C. Truck Scale
D. Woods Scale

		DAYS
UNIT XVII.	Sealing and Grading Logs, cont. E. Water Scale F. Roll Out Scale G. How Logs are Measured H. Defect in Logs I. Grading and Scaling Rules J. Species of Logs K. Net Scale L. Gross Scale M. Cubic Scale N. Board Foot Scale O. Scale by Weight P. "CUNIT" Scale	
UNIT XVIII.	Loading of Logs A. "A" Frame B. Crotch Line C. Hay Rack D. Heel Book E. Shovel F. Self-loading Trucks G. Par-buckle (Large Logs) H. Roll Way I. Grapple	2 - 5
UNIT XIX.	Climbing A. Why B. Equipment C. Techniques D. Dangers E. Safety Measures	1 - 5
UNIT XX.	Splitting Wood A. Correct Use of Wedges B. Correct Use of Malls C. Measuring Wood: rick, cord D. Best Type of Wood for Fireplaces	2 - 5
UNIT XXI	Safety - In general, safety should be taught and emphasized from the first day, every day, every activity, every hour, to each individual and to the group as a whole.	2 - 5

DAYS

UNIT XXI Safety, cont.

A. Danger in Logging Operation
   1. Factors Involved
   2. Tremendous Weights Being Handled
   3. Powerful Forces Being Applied
   4. Unforseeable Situation
   5. Constant Variable Factors Every Minute
B. "Each Man for Himself" philosophy in early day logging
C. Modern Philosophy of Industry Concerning Safety
D. What Safety Really Is
E. Who Is Responsible for Safety
F. When Accidents Happen, Why They Happen
G. The Human Factor
H. The State of Mind of the Individual When Accident Happened
I. "The Bight of the Line"
J. Hard Hats
K. Why Loggers Wear the Clothing They Do
L. "Horse Play" in the Logging Industry
M. First Aid
N. State Safety Manual

UNIT XXII. Hauling Logs 2 - 5

A. Getting Contract or Job
B. Going over Route
C. PUC Laws and Regulations
D. Local Weather Conditions
E. Type of Roads
F. Off-highway or Highway Haul
G. Job Rate Truck
   1. Brand
   2. Motor
   3. Frame
   4. Single axle vs. tandem axle
   5. Transmission
   6. Type of Rear Ends
   7. Tire size, and Capacity
H. Daily Truck Maintenance
I. Major Overhauls
J. Diesel Truck Maintenance
K. Jake Brakes

		DAYS
UNIT XXIII.	Tree and Log Identification	2 - 5
	A. With 2" x 2" Slides, Scaling Ramp Observation, and Actually Observing the Standing Tree B. Needles C. Bark D. Where Growing E. Color of Bark and Wood	
UNIT XXIV.	Rigging Blocks for Extra Power	2 - 4
	A. One Block Power B. A Luff Power C. The Power of a Par-Buckle	
UNIT XXV.	The Worker	2 - 4
	A. What You Sell When You Ask For a Job B. What a "Work Day" Consists of C. What Your Obligations Are to Your Employer D. How To Be Favorably Noticed by Your Supervisor E. How to Get Ahead F. Being on Time and Being There Every Day G. How to Get Fired H. What Our System of Free Enterprise "USED TO BE" About I. "Dead Wood" J. Unions K. "Pay Day" L. "Quitting a Job"	

Logging and Forestry Practices

Texts and References

Trier, Forest Conservation
Trees, Year Book of Agriculture, 1949
Pamphlet, Trees of Washington
Outdoors, Year Book of Agriculture, 1967
Forestry Handbook
Wackerman, Harvesting Timber Crops
Extension Bulletins
U.S.F.S. Bulletins
DNR Bulletins
Oregon Chain Manual

Visuals

Washington State Film Library
OSU Forestry Audio Visual Material
Weyerhauser Co.
Work of the Chokerman
Work of the Faller etc - Washington State Series
Industrial Safety Films
U.S.F.S. Films

Logging and Forestry Practices

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Trier, Forest Conservation
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